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EXAMINER	
NGUYEN, THUAN V	

ART UNIT	PAPER NUMBER
4145	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	**Application No.** 10/575,706	**Applicant(s)** VAANANEN ET AL.	
	Examiner THUAN NGUYEN	**Art Unit** 4145	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5,7 and 9-11* is/are rejected.

7)☐ Claim(s) *2,6,8,12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *04/13/2006*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 6 and 12 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only, while claim 6 refers to both claim 1 and claim 2, and claim 12 refers to both claim 7 and claim 8. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.

2. Claims 1 and 7 are objected to because of the following informalities: both claims include the word "characterized", which is not in accordance with standard US practice. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 5, 7 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saikusa (US 2004/0190550 A1) in view of Xu (US 2003/0231594 A1).

5. As per claim 1, Saikusa teaches *a method for controlling the congestion management and the scheduling of transmission link capacity in packet-switched telecommunications* (Saikusa, figure 7 teaches a method for scheduling packets to be transmitted over a link according to their priority, as part of congestion management) *in which method:*

- *digital information is transmitted as constant or variable-length packets* (Saikusa, figure 7, element 44 is the packet scheduling module, which receives packets from the public Internet (Saikusa, figure 4, element 7 is the public Internet), and the public Internet by its nature carries a wide variety of applications which have either constant or variable-length packets.)

- *identifier data is attached to the packets, on the basis of which the packets are divided into at least two different service level classes* (Saikusa, figure 7, element 14 is a packet classifier, which identifies packets according to data identifiers then separates packets into classes 0 to 3).

- *on the basis of the service level class data, each packet is routed to one of the FIFO queues, which are one for each service level class* (Saikusa, figure 7 shows packets routed to FIFO queues according to each class.)

-*the packets belonging to the same service level class form a flow, in which the transmission order of the packets is retained* (Saikusa, figure 7 shows packets of the same class form a flow with transmission order retained.)

- *the available capacity of the outgoing link or links of the system is scheduled for the service-level-class-specific FIFO queues using a weighting-coefficient-based*

scheduling method, a priority-based [sequencing] { scheduling } method, or a combination of these methods (Saikusa, figure 7, shows packets are scheduled based on weighting coefficients such as classes 1 and 2, or priority such as classes 0 and 3).

- *characterized in that the packet-specific priority value in the priority-based scheduling and/or the weighting coefficient in the weighting-coefficient-based scheduling* (W1 and W2 in Saikusa, figure 7) *is defined from the joint effect of a variable q* (V in Saikusa, paragraph [0103]) *and a variable vector x* (r in Saikusa, paragraph [103]) *and that the selection of the packets within a specific service level class* (class 1 and class 2 in Saikusa, figure 7), *to which dropping or marking will be applied in a congestion situation, are defined from the effect of the variable vector x* (r in Saikusa, paragraph [103]), *in which the variable q is defined from the service level class (COS), to which the traffic represented by which the packet in question belongs* (Saikusa, paragraph [0102] teaches that V is the minimally guaranteed rate for Class 1), *and the variable vector x is formed of the results provided by measurement applied to the traffic flow representing the service level class being examined* (Saikusa, paragraph [0101] teaches that r is measured on Class 0 traffic), *OR of variables derived from the relevant results, in which the measurement results depend on temporal variation in the data transmission speed of the traffic representing the traffic flow being examined, and on the distribution between the different sub-groups of the packets representing the traffic flow being examined.*

Saikusa does not teach *at least one service level class is such that identifier data is attached to the packets belonging to it, with the aid of which the packets are divided into*

at least two internal sub-groups (e.g., drop precedence) in the service level class; congestion in the service-level-class-specific FIFO queues is limited by dropping or marking (ECN, Explicit Congestion Notification) packets in the queue or arriving in the queue.

However Xu teaches *at least one service level class is such that identifier data is attached to the packets belonging to it, with the aid of which the packets are divided into at least two internal sub-groups (e.g., drop precedence) in the service level class* (Xu, paragraph [0043] teaches that within each class, packets are given different drop precedence priorities based on the drop precedence data (lines 1-3), grouped by subclasses (Xu, paragraph [0043] line 16)); *congestion in the service-level-class-specific FIFO queues is limited by dropping or marking (ECN, Explicit Congestion Notification) packets in the queue or arriving in the queue* (Xu, paragraph [0043] lines 15-18, teaches that packets are dropped according to their precedence subclasses to avoid congestion).

Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement *at least one service level class is such that identifier data is attached to the packets belonging to it, with the aid of which the packets are divided into at least two internal sub-groups (e.g., drop precedence) in the service level class; congestion in the service-level-class-specific FIFO queues is limited by dropping or marking (ECN, Explicit Congestion Notification) packets in the queue or arriving in*

the queue of Xu into Saikusa, since Saikusa suggests dividing traffic into classes for scheduling and congestion control (something broad) in general, and Xu suggests the beneficial use of further dividing traffic into subclasses and drop packets in a queue such as to allow packets within a class be further controlled and weighed to only drop packets that would have a lower utility to the end user in a congestion condition (Xu, paragraph [0044], lines 7-11) and to avoid congestion (Xu, paragraph [0043], lines 17-18) in the analogous art of packet communications.

6. As per claim 5, Saikusa and Xu teach claim 1. Saikusa also teaches *controlled by the variable vector x* (Saikusa, figure 7, element 45 calculates weighting coefficients W1 and W2 based on the measured rate **r**). Saikusa does not teach *the WRED (Weighted Random Early Detection) method is used as the congestion limitation method*. However Xu also teaches *the WRED (Weighted Random Early Detection) method is used as the congestion limitation method* (Xu, paragraph [0043], Lines 4-5 teaches that the WRED method is used to selectively drop packets based on precedence). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement *using the WRED (Weighted Random Early Detection) method* of Xu into Saikusa, since Saikusa suggests congestion control (something broad) in general, and Xu suggests the beneficial use of WRED such as to drop packets in a selective manner so that only less important packets are discarded when congestion occurs in the analogous art of data communications.

7. As per claim 7, Saikusa teaches *an equipment for controlling the congestion management and the scheduling of transmission link capacity in packet-switched telecommunications* (Saikusa, figure 7 teaches an equipment for scheduling packets to be transmitted over a link according to their priority, as part of congestion management) *in which the equipment includes:*

- *means for receiving constant or variable-length packets* (Saikusa, figure 7, element 44 is the packet scheduling module, which receives packets from the public Internet (Saikusa, figure 4, element 7 is the public Internet), and the public Internet by its nature carries a wide variety of applications which have either constant or variable-length packets.)

- *means for reading the identifier data attached to the packets, on the basis of which the packets can be divided into at least two different service level classes* (Saikusa, figure 7, element 14 is a packet classifier, which identifies packets according to data identifiers then separates packets into classes 0 to 3).

- *means for dividing the packets into at least two different service level classes* (Saikusa, figure 7, element 14 divides the incoming packets into 4 different service level classes numbered 0 to 3).

- *a FIFO queue for each of the service level classes* (Saikusa, figure 7 shows 4 FIFO queues, each corresponding to a service level class).

- *means for routing a packet in the FIFO queue corresponding the relevant service level class, on the basis of the service level class data,* (Saikusa, figure 7 shows packets routed to FIFO queues according to each class).

- *a scheduler for scheduling the capacity available to the outgoing link or links from the system to the service-level-class-specific FIFO queues using a weighting-coefficient-based scheduling method* (Saikusa, figure 7, element 13 is a scheduler based on weighting coefficients)*, a priority-based scheduling method, or a combinatio1n of these methods* (Saikusa, figure 7, element 32 is a scheduler based on weighting and priority).
- *means for sending packets to the outgoing link or links, in a transmission order defined by the scheduler* (Saikusa, figure 7 shows packets going out after the scheduler of element 32, thus implies the inherent means to send packets to the outgoing link in the order defined by the scheduler 32).
- *characterized in that the equipment includes means, with the aid of which a packet-specific priority value can be defined in priority-based scheduling and/or a weighting coefficient can be defined in weighting-coefficient-based scheduling* (weighting coefficients W1 and W2 are defined in Saikusa, figure 7, element 45) *on the basis of the joint effect of a variable q* (V in Saikusa, paragraph [0103]) *and a variable vector x* (r in Saikusa, paragraph [103]), *and with the aid of which means the selection of the packets within the service level class* (class 1 and class 2 in Saikusa, figure 7), *to which dropping or marking is applied in a congestion situation, can be defined from the effect of the variable vector x* (r in Saikusa, paragraph [103]), *in which the variable q is defined from the service level class (COS), to which the traffic represented by which the packet in question belongs* (Saikusa, paragraph [0102] teaches that V is the minimally guaranteed rate for Class 1)*, and the variable vector x is formed of the results provided by measurement applied to the traffic flow representing the service level class being*

examined (Saikusa, paragraph [0101] teaches that r is measured on Class 0 traffic), ***or of variables derived from the relevant results, in which the measurement results depend on temporal variation in the data transmission speed of the traffic representing the traffic flow being examined, and on the distribution between the different sub-groups of the packets representing the traffic flow being examined.***

Saikusa does not teach *means for reading identifier data attached to the packets on the basis of which the internal sub-group (e.g., drop precedence) of the service level class, to which the packet in question belongs, can be determined*; *means for limiting the congestion of the service-level-class-specific FIFO queues, by dropping or marking (ECN, Explicit Congestion Notification) packet in a queue or arriving in a queue.*

However Xu teaches *means for reading identifier data attached to the packets on the basis of which the internal sub-group (e.g., drop precedence) of the service level class, to which the packet in question belongs, can be determined* (Xu, paragraph [0043] teaches that within each class, packets are given different drop precedence priorities based on the drop precedence data (lines 1-3), and means to do so, i.e. to read identifier data and determine data precedence, in paragraph [0044]); *means for limiting the congestion of the service-level-class-specific FIFO queues, by dropping or marking (ECN, Explicit Congestion Notification) packet in a queue or arriving in a queue* (Xu, paragraph [0043] lines 15-18, teaches that queued packets are dropped according to

their precedence subclasses to avoid congestion, and means to do so in paragraph [0044]).

Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement *means for reading identifier data attached to the packets on the basis of which the internal sub-group (e.g., drop precedence) of the service level class, to which the packet in question belongs, can be determined*; *means for limiting the congestion of the service-level-class-specific FIFO queues, by dropping or marking (ECN, Explicit Congestion Notification) packet in a queue or arriving in a queue* of Xu into Saikusa, since Saikusa suggests dividing traffic into classes (something broad) in general for scheduling and congestion control, and Xu suggests the beneficial use of further dividing traffic into subclasses and drop packets in a queue such as to allow packets within a class be further controlled and weighed to only drop packets that would have a lower utility to the end user in a congestion condition (Xu, paragraph [0044], lines 7-11) and to avoid congestion (Xu, paragraph [0043], lines 17-18) in the analogous art of packet communications.

8. As per claim 11, Saikusa and Xu teach claim 7. Saikusa also teaches *that the equipment includes means, with the aid of which congestion limitation controlled using the variable vector x can be performed* (Saikusa, figure 7, element 45 calculates the weighting coefficients W1 and W1 based on rate **r** measured by element 36). Saikusa does not teach *using the WRED (Weighted Random Early Detection) method.* However

Xu teaches *using the WRED (Weighted Random Early Detection) method* (Xu, paragraph [0043], Lines 4-5 teaches that the WRED method is used to selectively drop packets based on precedence). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement *using the WRED (Weighted Random Early Detection) method* of Xu into Saikusa, since Saikusa suggests congestion control (something broad) in general, and Xu suggests the beneficial use of WRED such as to drop packets in a selective manner so that only less important packets are discarded when congestion occurs in the analogous art of data communications.

9. Claims 3-4 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saikusa (US 2004/0190550 A1) and Xu (US 2003/0231594 A1), in view of Deforche (US 2004/0258072 A1).

10. As per claim 3, Saikusa and Xu teach claim 1. Saikusa and Xu do not teach *that the SFQ (Start-time Fair Queuing) method is used as the weighting-coefficient-based scheduling method*. However Deforche teaches *that the SFQ (Start-time Fair Queuing) method is used as the weighting-coefficient-based scheduling method* (Deforche, paragraph [0008], teaches that SFQ is one of the most noteworthy scheduling methods.) Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement *that the SFQ (Start-time Fair Queuing) method is used as the weighting-coefficient-based scheduling method* of Deforche in to Saikusa

and Xu, since Saikusa and Xu teach of packet scheduling (something broad) in general, and Deforche suggests the beneficial use of the SFQ method such as to reduce the complexity incurred by other scheduling methods (Deforche, paragraph [0008]) in the analogous art of data communications.

11. As per claim 4, Saikusa and Xu teach claim 1. Saikusa and Xu do not teach *that the WFQ (Weighted Fair Queuing) method is used as the weighting-coefficient-based scheduling method.* However Deforche teaches *that the WFQ (Weighted Fair Queuing) method is used as the weighting-coefficient-based scheduling method* (Deforche, paragraph [0016] teaches that WFQ is a popular scheduling method. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement *that the WFQ (Weighted Fair Queuing) method is used as the weighting-coefficient-based scheduling method* of Deforche into Saikusa and Xu, since Saikusa and Xu teach of packet scheduling (something broad) in general, and Deforche suggests the beneficial use of the WFQ method such as to take advantage of the useful properties of WFQ with respect to bandwidth, proportional fairness, and delay (Deforche, paragraph [0016]) in the analogous art of data communications.

12. As per claim 9, Saikusa and Xu teach claim 7. Saikusa and Xu do not teach *that the equipment includes means for performing weighting-coefficient-based scheduling using the SFQ (Start-time Fair Queuing) method.* However Deforche teaches *that the equipment includes means for performing weighting-coefficient-based scheduling using*

the SFQ (Start-time Fair Queuing) method (Deforche, paragraph [0008], teaches that SFQ is one of the most noteworthy scheduling methods.) Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement *that the equipment includes means for performing weighting-coefficient-based scheduling using the SFQ (Start-time Fair Queuing) method* of Deforche in to Saikusa and Xu, since Saikusa and Xu teach of packet scheduling (something broad) in general, and Deforche suggests the beneficial use of the SFQ method such as to reduce the complexity incurred by other scheduling methods (Deforche, paragraph [0008]) in the analogous art of data communications.

13. As per claim 10, Saikusa and Xu teach claim 7. Saikusa and Xu do not teach *that the equipment includes means for performing weighting-coefficient-based scheduling using the WFQ (Weighted Fair Queuing) method.* However Deforche teaches *that the equipment includes means for performing weighting-coefficient-based scheduling using the WFQ (Weighted Fair Queuing) method* (Deforche, paragraph [0016] teaches that WFQ is a popular scheduling method). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement *that the equipment includes means for performing weighting-coefficient-based scheduling using the WFQ (Weighted Fair Queuing) method* of Deforche into Saikusa and Xu, since Saikusa and Xu teach of packet scheduling (something broad) in general, and Deforche suggests the beneficial use of the WFQ method such as to take advantage of the useful

properties of WFQ with respect to bandwidth, proportional fairness, and delay (Deforche, paragraph [0016]) in the analogous art of data communications.

Allowable Subject Matter

14. Claims 2 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THUAN NGUYEN whose telephone number is (571)270-7189. The examiner can normally be reached on 7:30 AM to 5:00 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pankaj Kumar can be reached on 571-272-3011. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

T.N.

/Pankaj Kumar/

Supervisory Patent Examiner, Art Unit 4145